on the desk to consult from time to time upon questions of exact fact. The interest in this line of investigation is so intense at present that it is perfectly obvious that enough new facts will be accumulated in another season to warrant the adding of several chapters.

L. O. HOWARD

The Progress of Scientific Chemistry in Our Own Times. By SIR WILLIAM A. TILDEN. New York, Longmans, Green and Co. 1913. Second edition. 15 × 20 cm. Pp. v + 366. Price, $2.25 net.

The period covered by the book is from 1837 to the present. The first date was selected because Queen Victoria then came to the throne, while the scientific justification might be that at that time the influence of Liebig's teaching was beginning to be felt. After the usual preliminary chapter on Lavoisier, Cavendish, Dalton and Berzelius, we get to the book proper. We start with the conservation of energy and Joule's determination of the thermodynamic equivalent of heat. This leads at once to Hess's law of thermochemistry, to the experiments of Julius Thomsen, to Berthelot's enunciation of his principle of maximum work, and to St. Claire Deville's work on dissociation. The second chapter—which perhaps should have been the first—deals with the distribution of the chemical elements and the recognition of them by the chemist. This, of course, involves Bunsen and Kirchhoff's work on spectrum analysis, the discovery of argon by Rayleigh and Ramsay, and the isolation of the other noble gases by Ramsay. The elements being given, the third chapter deals with the determination of the atomic weights, including the theoretical reforms of Cannizzaro and the experimental researches of Dumas, Stas and others. The work of Gerhardt, Laurent and others on types is also taken up in this chapter. This seems a mistake because the work has to be discussed later in its proper place. The justification for its inclusion at this point seems to be that it was necessary in order to determine the atomic ratios of carbon to hydrogen and oxygen. While this is doubtless true historically, it would have been more artistic to have passed over this difficulty gracefully and thus to have avoided repetition.

Once we have the atomic weights determined, we are confronted with Prout's hypothesis. The third edition will undoubtedly contain the account of the resurrection of this hypothesis by Rutherford, but only a prophet could have included that in this edition. After Prout's hypothesis has been disposed of, the remainder of the fourth chapter is devoted to Mendeléeff's periodic law and its developments. The question of constitutional formulas comes up in the fifth chapter, which carries us through the work of Kekulé. The fruitfulness of Kekulé's conception is brought to our minds clearly in the account of synthetical organic chemistry in the sixth chapter. In the seventh chapter we have Pasteur's work on optically active substances, and the theory of stereochemistry as developed by van't Hoff and Le Bel. The next step, historically and logically, is from the problem of the molecular structure to that of chemical affinity, and the eighth chapter is consequently devoted to a discussion of electricity and chemical affinity.

Up to this point, the treatment has been logical and coherent; but the ninth chapter is an intercalated one on the liquefaction of gases. There is no conceivable reason for introducing this chapter at this point except that the author perhaps did not know where else to put it. As a matter of fact it should have come in just before the account of Ramsay's isolation of the noble gases of the atmosphere. Presumably it was not put there because the author wished to discuss the liquefaction of helium, which he could not do until he had introduced helium to his audience. He should however have discussed the general problem of the liquefaction of gases as an introduction to Ramsay's work and he could then have taken up the liquefaction of helium as a special fact under the general properties of helium.

If this had been done, we should have passed directly from the chapter on chemical affinity to that on radioactivity. The loose ends are gathered up in a final chapter which includes

remarks on photochemistry, colloids and research work in Great Britain. Altogether this is a very readable book and all the more so because of the continuity of plan, which is quite unusual. Most writers of historical outlines content themselves—or are forced to content themselves—with isolated chapters. It is really quite a feat to have avoided this danger to so great an extent as Sir William Tilden has done.

The reviewer is entirely in sympathy with the contention, in the preface, that students should not only know the names of the leaders of scientific thought, but should perceive correctly the connection between their discoveries and the general progress of their science. In order to bring this about, a series of biographical notes has been appended to each chapter. In these notes are given a brief sketch of the life and work of every deceased chemist or physicist who has contributed substantially to the progress thus far accomplished.

Wilder D. Bancroft

BOTANICAL NOTES

PROTOCOCCUS, NOT PLEUROCOCCUS

In a recent number of *Nyt Magazin for Naturvidenskaberne* (Christiania) N. Wille gives the results of his studies of the actual specimens of certain lower green algae prepared by C. A. Agardh, and still preserved in the herbarium of the University of Lund, Sweden. One outcome of these is the settlement of the question as to whether or not the name *Protococcus* is still valid. As every teacher knows there has been a strong tide against the use of the name *Protococcus* for the common green slime of tree-trunks and walls, the preferred name being *Pleurococcus.* In the paper under consideration the author first gives a summary history of the nomenclatural tangle which has arisen. In 1824 C. A. Agardh named a certain plant *Protococcus viridis.* In 1842 J. Meneghini, not knowing Agardh's plants, proposed the name *Pleurococcus,* and included blue-green as well as green species, and among the latter he included the plants named *Protococcus viridis* by Agardh. Other forms of confusion resulted from this initial blunder of Meneghini's but what is here given is sufficient to warrant Wille's conclusion:

> It is clear that in order to disentangle such a confused mass of synonyms one must go back to the original specimens to determine what C. A. Agardh really understood by his species *Protococcus viridis.*

So he examined the original specimens and found that the specimens labeled *Protococcus viridis* are what later authors have called *Pleurococcus.* This fact requires, as Wille says, that "this species must therefore be called *Protococcus viridis.*"

Since *Pleurococcus* was used by Meneghini for blue-green and also green algæ that name is left badly discredited, and must doubtless fall into synonymy.

SHORT NOTES

Some recent systematic papers are: A Consideration of Structure in Relation to Genera of Polyporaceae, by Doctor Adeline Ames (*Ann. Mycol.,* Vol. XI.), including a key to, and descriptions of sixteen genera, with four half-tone plates; New Fucaceae, by N. I. Gardner (Calif. Univ. Pub., Vol. 4), containing descriptions of some western rockweeds and their close allies, and accompanied by eighteen half-tone plates of excellent photographs of the plants described.

Bulletins 284 and 285 of the Bureau of Plant Industry of the U. S. Department of Agriculture on the Water Requirement of Plant deal with some of the scientific facts that underlie the practical aspects of agriculture. In the first the joint authors, L. J. Briggs and H. L. Shantz, report in detail upon their investigations made at the dry-land experiment station at Akron, in northeastern Colorado, in the years 1910 and 1911. The bulletin is a valuable contribution to the physiology of the water loss sustained by plants under arid conditions. In the second bulletin the same authors have rendered a most welcome service to plant physiologists by presenting in summary form a review of the literature of the water requirement and water loss